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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/795,998	03/10/2004	Yoshio Harada	P24845	2654
7055	7590	11/03/2006	EXAMINER	
GREENBLUM & BERNSTEIN, P.L.C. 1950 ROLAND CLARKE PLACE RESTON, VA 20191			IVEY, ELIZABETH D	
			ART UNIT	PAPER NUMBER

1775

DATE MAILED: 11/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/795,998

Applicant(s)

HARADA ET AL.

Examiner

Elizabeth Ivey

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) 8 and 9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 10-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 8/06.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1 and 3 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,985,467 to Beele.

Regarding claims 1 and 3, Beele discloses a substrate with a MCrAlY bond coat (undercoat) a chromia and/or alumina anchoring layer (middle layer) on the bond coat and a stabilized zirconia thermal barrier (top coat) on the anchoring layer (column 5 lines 8, 20-28 and 43-46). Beele discloses the thickness of the anchoring layer as from a few atomic layers to less than 3mm fully overlapping the claimed range of 0.2-10 $\mu$ m. Claim 3 is a product by process claim wherein the patentability of the product does not depend on its method of production. “If the product in the product by process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process unless it can be shown that the product produced by the process is in some manner measurably

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distinct from the product produced by another process.” See *MPEP 2113*. As such, the process limitation within claim 3 does not provide patentable distinction over the prior art.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,985,467 to Beele as applied to claim 1 in view of U.S. Patent 5,273,712 to Czech et al.

Beele discloses all of the limitations of claim 1 but does not explicitly disclose an Al content of the MCrAlY layer. However, Beele refers to Czech and discloses that the MCrAlY used could be that used in Czech. Czech discloses an a MCrAlY coating in which M is Ni or Fe

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or Co and Y may be replaced with any equivalent from the group of rare earths. Al content of 0-15 wt% overlapping the claimed range of 3-24 mass%. Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to use the MCrAlY composition of Czech in the bond coat of Beele as suggested by Beele. Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have selected the overlapping portion of the ranges disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness, *In re Malagari*, 182 USPQ 549.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,985,467 to Beele as applied to claim 1 in view of U.S. Patent 4,714,624 to Nalk.

Regarding claim 6, Beele discloses all of the limitations of claim 1 but does not explicitly disclose a MCrAlY layer thickness but discloses it as thicker than the anchoring layer. Nalk discloses a MCrAlY layer thickness of 25-250 $\mu$ m overlapping the claimed range of 30-50 $\mu$ m thick. Furthermore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to use a thickness within the claimed range because "The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages." *In re Hoeschele*, 406 F.2d 1403, 160 USPQ 809(CCPA 1969). Nalk discloses the MCrAlY layer to be applied by vapor deposition or spray, however, applicant is reminded that it is the product itself which must be new and unobvious, see *In re Pinkington* 162 USPQ 145, 147 (C.C.P.A. 1969). Product by process claimed are not patentably distinct over product claims unless it can be shown that the product produced by the process is in some manner measurably

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distinct from the product produced by another process, therefore there will be no weight given to the product by process verses product claims.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,985,467 to Beele as applied to claim 1 in view of U.S. Patent 5,514,482 to Strangman.

Regarding claim 7, Beele discloses all of the limitations of claim 1 and discloses a stabilized zirconia topcoat applied by methods such as electron beam physical vapor deposition but does not explicitly disclose the stabilizer percentage or the layer thickness (column 5 lines 64-67 and column 6 lines 24-32). However, Strangman discloses a zirconia thermal barrier for use with a MCrAlY bond coat on a turbine component. Strangman discloses the zirconia may be stabilized with CaO, MgO, CeO<sub>2</sub> and Y<sub>2</sub>O<sub>3</sub> and may contain 0-20 wt% Y<sub>2</sub>O<sub>3</sub> overlapping the claimed range of 5-40 mass% Y<sub>2</sub>O<sub>3</sub> (column 4 lines 64-67 and claim 29). Strangman discloses a zirconia layer thickness of 0.5-50 mils (12.7-1270 $\mu$ m) thick overlapping the claimed range (claim 3). It would have been obvious to a person having ordinary skill in the art at the time of the invention to use the composition and thickness of the zirconia layer of Strangman as a functional equivalent of Beele since Beele did not indicate a specific composition or thickness. Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have selected the overlapping portion of the thickness and compositional ranges disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness, *In re Malagari*, 182 USPQ 549. Although Beele discloses EBPVD as the application method of the zirconia, applicant is reminded that it is the product, itself, which must be new and unobvious, see *In re Pinkington* 162 USPQ 145, 147 (C.C.P.A. 1969). Product by

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process claimed are not patentably distinct over product claims unless it can be shown that the product produced by the process is in some manner measurably distinct from the product produced by another process, therefore there will be no weight given to the product by process verses product claims.

Claims 2, 4 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,985,467 to Beele in view of U.S. Patent 6,387,526 B1 to Beele.

Regarding claims 2, 4 and 10, Beele ('467) discloses a substrate with a MCrAlY bond coat (undercoat), a vapor deposited chromia and/or alumina anchoring layer (middle layer) on the bond coat and a stabilized zirconia thermal barrier (top coat) on the anchoring layer (column 5 lines 8, 20-28 and 43-46). Beele ('467) discloses the thickness of the anchoring layer as from a few atomic layers to less than 3mm fully overlapping the claimed range of 0.2-10 $\mu$ m. Beele ('467) does not specifically disclose both a 1-30 $\mu$ m thick alumina layer and a chromia layer. However Beele ('526) discloses an upto 1 $\mu$ m thick alumina or chromia layer preferably grown on the MCrAlY coating to promote better adhesion of the thermal barrier to the MCrAlY layer. Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to use a thermally grown alumina layer with the deposited chromia layer of Beele ('467) to optimize the adhesion of the thermal barrier to the MCrAlY bond coat.

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Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,985,467 to Beele in view of U.S. Patent 6,387,526 B1 to Beele in view of U.S. Patent 5,273,712 to Czech et al.

Regarding claim 11, Beele ('467) and Beele ('526) disclose all of the limitations of claim 2 but do not explicitly disclose an Al content of the MCrAlY layer. However, Beele refers to Czech and discloses that the MCrAlY used could be that used in Czech. Czech discloses an a MCrAlY coating in which M is Ni or Fe or Co and Y may be replaced with any equivalent from the group of rare earths. Al content of 0-15 wt% overlapping the claimed range of 3-24 mass%. Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to use the MCrAlY composition of Czech in the bond coat of Beele as suggested by Beele. Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have selected the overlapping portion of the ranges disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness, *In re Malagari*, 182 USPQ 549.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,985,467 to Beele in view of U.S. Patent 6,387,526 B1 to Beele in view of U.S. Patent 4,714,624 to Nalk.

Regarding claim 12, Beele ('467) and Beele ('526) disclose all of the limitations of claim 2 but do not explicitly disclose a MCrAlY layer thickness but disclose it as thicker than the anchoring layer. Nalk discloses a MCrAlY layer thickness of 25-250 $\mu$ m overlapping the



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claimed range of 30-50 $\mu$ m thick. Furthermore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to use a thickness within the claimed range because "The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages." In re Hoeschele, 406 F.2d 1403, 160 USPQ 809(CCPA 1969). Nalk discloses the MCrAlY layer to be applied by vapor deposition or spray, however, applicant is reminded that it is the product itself which must be new and unobvious, see In re Pinkington 162 USPQ 145, 147 (C.C.P.A. 1969). Product by process claimed are not patentably distinct over product claims unless it can be shown that the product produced by the process is in some manner measurably distinct from the product produced by another process, therefore there will be no weight given to the product by process verses product claims.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,985,467 to Beele in view of U.S. Patent 6,387,526 B1 to Beele in view of U.S. Patent 5,514,482 to Strangman.

Regarding claim 13, Beele ('467) and Beele ('526) disclose all of the limitations of claim 2 and Beele ('467) discloses a stabilized zirconia topcoat applied by methods such as electron beam physical vapor deposition but does not explicitly disclose the stabilizer percentage or the layer thickness (column 5 lines 64-67 and column 6 lines 24-32). However, Strangman discloses a zirconia thermal barrier for use with a MCrAlY bond coat on a turbine component. Strangman discloses the zirconia may be stabilized with CaO, MgO, CeO<sub>2</sub> and Y<sub>2</sub>O<sub>3</sub> and may contain 0-20 wt% Y<sub>2</sub>O<sub>3</sub> overlapping the claimed range of 5-40 mass% Y<sub>2</sub>O<sub>3</sub>.

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(column 4 lines 64-67 and claim 29). Strangman discloses a zirconia layer thickness of 0.5-50 mils (12.7-1270 $\mu$ m) thick overlapping the claimed range (claim 3). It would have been obvious to a person having ordinary skill in the art at the time of the invention to use the composition and thickness of the zirconia layer of Strangman as a functional equivalent of Beele ('467) since Beele ('467) did not indicate a specific composition or thickness. Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have selected the overlapping portion of the thickness and compositional ranges disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness, *In re Malagari*, 182 USPQ 549. Although Beele discloses EBPVD as the application method of the zirconia, applicant is reminded that it is the product, itself, which must be new and unobvious, see *In re Pinkington* 162 USPQ 145, 147 (C.C.P.A. 1969). Product by process claimed are not patentably distinct over product claims unless it can be shown that the product produced by the process is in some manner measurably distinct from the product produced by another process, therefore there will be no weight given to the product by process verses product claims.

### ***Response to Arguments***

Examiner acknowledges applicant's submission of translated priority document and withdraws rejections to Darolia.

Applicant's arguments with respect to claims 1-7 and 10-13 have been considered but are moot in view of the new ground(s) of rejection.

*Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth Ivey whose telephone number is (571) 272-8432. The examiner can normally be reached on 7:00- 4:30 M-Th and 7:00-3:30 alt. Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Elizabeth D. Ivey



JENNIFER MCNEIL  
SUPERVISORY PATENT EXAMINER

10/29/06